

## On the Occurrence of Pseudogyne of *Formica japonica* MOTSCHULSKY (Hymenoptera, Formicidae) in Japan

Rikio SONOBE

Biological Institute, Faculty of Science, Tohoku University, Sendai 980, Japan

**Synopsis** Pseudogyne of *Formica japonica* MOTSCHULSKY is described.

### Introduction

It has already been recorded that in various genus groups of ants the intermediate types between male, female and worker are sometimes recognized. For example, in Western Europe and North America, *Formica* ant sometimes shows pseudogyne which is regarded as one of intermediate types between normal female and worker. Although the occurrence of pseudogyne has not yet been reported in Japan, the author observed many pseudogynes in the colony of *Formica japonica* in Miyazaki City (collected by Prof. Masaki KONDOH, Shiraume Junior College of Tokyo). The aim of this report is to recall the attention of investigators associated with this field.

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### Results

#### 1) *Diagnosis of pseudogyne*

In view of external features, two main types, A and B, were distinguished.

The size of Type A is about the same as that of worker. This has well-developed and highly raised mesonotum, and is characterized by scutellum which is clearly distinguished from other parts. The characteristics as above are the same as those of normal female with the exception of a feature of small size. However, this type has neither parapsidal furrow nor parapteron which are seen in normal female. Body colour of this type is generally paler and more brownish than that of worker.

Type B is thought as an intermediate type between A and worker. It has well-developed and clearly raised mesonotum, but the separation of scutellum is obscure. The colour of the part from where scutellum may be formed is darker than that of the surrounding area. With the exception of the above-mentioned characters, B has the same features as A.

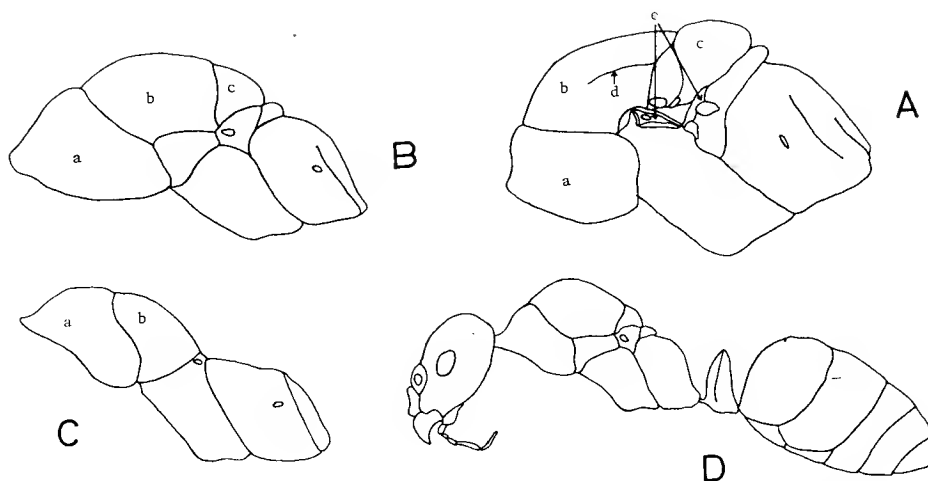


Fig. 1. Shape of the thorax of three types of female (A, B, C) and total figure of pseudogyne (D) of *Formica japonica*. — A: Normal female; B, D: Pseudogyne; C: Worker. a: pronotum; b: mesonotum (scutum particularly in normal female); c: scutellum; d: parapsidal furrow; e: parapteron.

## 2) Materials

The data of specimens are as follows:

Locality: On the campus of Faculty of Education, Miyazaki University,  
Miyazaki City, Miyazaki Prefecture, South Kyushu.

Date: June 2, 1967.

Collector: Masaki KONDOH.

|                    |                   |               |
|--------------------|-------------------|---------------|
| Caste constituent: | Normal female     | 9 individuals |
|                    | Worker            | 110 inds.     |
|                    | Pseudogyne A type | 85 inds.      |
|                    | B type            | 28 inds.      |

## 3) Body length

The body lengths of the four groups indicated above are measured with micrometer. The mean values for each type are given below with 95 % significance (mm).

|                   |                 |
|-------------------|-----------------|
| Normal female     | $8.23 \pm 0.55$ |
| Worker            | $4.96 \pm 0.07$ |
| Pseudogyne A type | $5.01 \pm 0.09$ |
| B type            | $4.93 \pm 0.14$ |

This result shows that pseudogyne is smaller than normal female and the difference between the body lengths of pseudogyne and worker is not significant.

## Discussion

As was mentioned above, the size of worker, possession of raised mesonotum,

frequent possession of furrows on thorax which are only seen in normal female, and the paler coloration are the same as those of the pseudogyne of *Formica* (*Neoformica*) *incerta* (WHEELER, 1910).

According to WHEELER (1910), the occurrence of pseudogyne which has hitherto been reported in foreign countries was caused by the existence of lomechusine beetles (Staphylinidae) in ant nests. Because of no beetle in the colony of ants, the occurrence of pseudogynes in Miyazaki City is not explained by the idea proposed by WHEELER. It seems that there is a significant relation between the facts that pseudogyne occurs in an ill-conditioned nest infested by lomechusine beetles and that Miyazaki City in southern Kyushu is located near the southern limit of horizontal distribution of *Formica japonica*.

### Summary

1. Many pseudogyne females were found in the colony of *Formica japonica* MOTSCHULSKY collected in June in Miyazaki City.

2. Pseudogyne is about the same size as worker, and the body colour is paler and more brownish. The mesonotum is highly raised and in many specimens the scutellum are recognized. However, it has neither parapsidal furrow nor parapteron.

### Reference

WHEELER, W. M., 1910. Ant: their Structure, Development and Behaviour. New York.